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Smart Integrated Trolley for Future Super Markets

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ABSTRACT

Among the various sectors that contribute to the economic growth of a country, the service sector, especially the retail sector, plays an important role. In that sense, the retail sector especially in supermarkets, in India is growing very fast. However, there is a problem in getting qualified labours for the development of the sector. Thus, this creates a situation where supermarkets lose their customers and their profits. Although various innovations have been implemented in the supermarkets to address these issues, it does not seem to be sufficiently satisfactory. Smart Integrated Trolley for Future Super Markets is recommended here to address these shortcomings. In this system, the control unit is integrated with the entrance unit, trolley unit, and check-out unit. Trolley will smartly receive the payment for the items selected by the customer and give the receipt. The customer can also ask about his doubts and queries through a wireless two-way communication device in the trolley. Using this system enables better service to customers and also helps to reduce the number of labours. And there is no doubt that supermarkets operating in more than one shift mode will increase the quality of their service and their profit margin when they use this system.

KEYWORDS: *Supermarkets, Growth, Qualified labours, Satisfactory, Integrated, smartly, wireless*

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I. INTRODUCTION:

Currently the growth of the retail sector is growing very fast all over the world especially in India. According to the Deloitte Indian Retail Market (2013) survey, food and groceries account for more than 60 per cent of the Indian retail economy. The retail market in 2015 was valued at US $ 600 billion and is expected to grow to US $ 1 trillion by 2020 at a growth rate of more than 10% p.a. However, there are currently not enough qualified employees available for the growth of the sector. Typically, a medium-sized supermarket with an area of 3,000 square feet in India employs about 15 people. Profits are currently low in the competitive retail sector. This creates a situation where the bulk of the profits have to be paid to the employees. And this sector is losing a lot of customers due to the activities of a few unqualified employees. This Smart Integrated Trolley for Future Super Markets has been developed with the aim of avoiding the above problems. This allows the customer to pick up the item they want and place the item on the scanner in the trolley. In this method the price of each item and the total price are visible on the monitor. The customer takes all the items he needs and scans the total amount visible on the monitor with the QR code on the trolley and pays the bill by money transfer. The goods he purchases are then available through a receipt printer with a unique barcode for their price, total bill amount and payment. Finally, the customer can show the unique barcode on his bill on the scanner where he checks the items purchased and he can take the items. If the customer has any doubts, he can contact the control unit through two-way voice communication in the trolley and resolve his doubts. Also, the person in the control unit constantly monitors the customers and makes voice communication with them if required. Through such procedures, the number of employees is greatly reduced, depending on the size of the retail shop, such as the cashier, the accountant, employees who is checking the purchased goods and assisting the customers. This improves the quality of the retail shop with the latest technology and customer service efficiency.

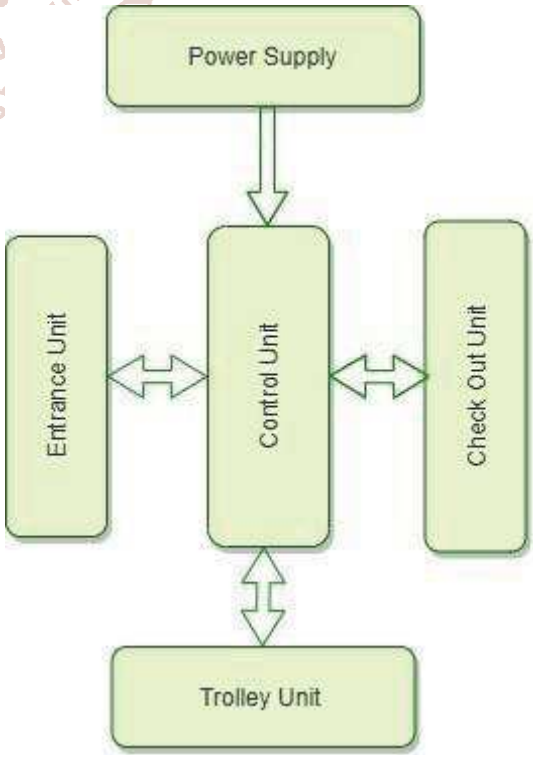


Fig 1: Block diagram of proposed system

II. PROPOSED DESIGN

Trolley Unit Consists of,

- Wireless barcode reader
- Wireless printer
- Wireless AI camera with two-way communication
- Wireless Touch screen
- Smart lock
- QR label

Entrance Unit Consists of,

- Wireless AI camera with two-way communication
- Wireless Touch screen

Check out Unit Consists of,

- Wireless barcode scanner

A. AI Camera with Two Way Audio:

It is a wireless weatherproof surveillance outdoor security camera with two-way audio, AI humanoid motion detection and colour night vision. The data are securely stored on the cloud. For producing colour night time imaging, here the spotlights can also be used as floodlights to illuminate hidden areas around the property. This camera detects the human movement. The microphone in this camera cancels the noise thereby providing a clear audio.

B. Wireless Bluetooth Thermal Receipt Printer:

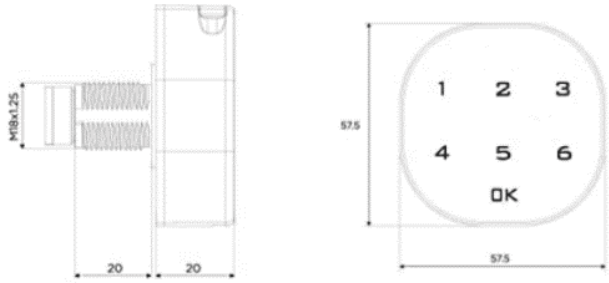
It is a wireless Bluetooth 4.0 connectivity for wireless mobile printing. It has a long head life of 150kms and 1.5 million cutter lives. The ports available in this printer are USB, LAN and serial RS232. It also monitors the printing function.

C. Wireless Barcode Scanner:

This 2.4 GHZ wireless barcode scanner has a USB receiver. It is a high-performance Laser Barcode Reader with sharp aim-and-shoot reading. The data are read fastly and accurately for the entry application. It has a high intensity reading. It supports 4 mil barcodes. And also, it scans all standard 1D barcodes. It is user friendly light weight and ergonomic design.

D. Smart Lock:

This smart lock protects furniture from unauthorized entry. It is a smart compressed digital lock which makes the sole guardian of the valuables on the furniture. A 4–16-digit code can be entered for PIN- both User Master PIN Code. It has an Auto Secure Mode in which the lock automatically engages after 4 wrong PIN attempts, for active protection. It has a Scramble PIN Code Technology, as enter any number within 16 digits, and the lock will unlock as long as the correct password is included in its original sequence. There is an external Battery Power Backup option if the battery runs out.



III. WORKING PROCEDURE

At the entrance of the supermarket where the system is installed, there is a monitor with a touch screen and an AI camera with two-way voice communication. Once the customer registers his cell phone number on the touch screen a secret number will generated to his phone, and as soon as he records it on the touch screen the AI camera takes a photo of him and tells him that he was allowed inside. The customer who goes inside can record the secret number given to him on the touch screen on the smart trolley and pick it up. Then the customer can turn on the button with the green LED on the scanner in the trolley and take the items thar he needs and show them on the scanner and put the items in to the trolley. The customer who goes inside can record the secret number given to him on the touch screen on the smart trolley and pick it up. Then he can turn on the button with the green LED on the scanner in the trolley, take the items he needs and show them on the scanner and put the items on the trolley. Each time the items with its price is displayed on a touch screen placed in the trolley and also the total bill amount is displayed. If he does not need any of the

items he has taken, he can turn on the red LED button on the scanner in the trolley, point to it and point it back to the scanner in the relevant area and place the items in its location. Now the bill amount for the item will be deducted and the total amount of the remaining items will be displayed on the touch screen. The customer can clear his doubts by talking to the person in the control room to ask where the particular item is, or if there is any other doubt by contacting the camera with the two-way voice communication in the trolley. Also, the person in the control room is monitoring what is happening here and he can also communicate with the customer if needed. Once the customer has purchased all the items he needs, the total bill amount displayed on the touch screen can be scanned by QR code label on the trolley and paid by money transfer. Receipt for purchase of goods, their price and total bill payment will come out of the printer with exclusive bar code. And the same information will come to his cell phone number. Finally the customer can show the exclusive barcode on his receipt on the scanner placed in the specified place and take the items he bought out. He will be alerted by alarm and voice alert if there is any change in the above procedures.

IV. CONCLUSION

In the growing Indian supermarket sector, the quality of the retail shop can be improved by establishing this system. And the reputation of the company will grow as the customer service is done in an innovative way to their satisfaction. In addition, the organization performs most of the essential functions of the company, reducing the number of employees and increasing the profit margin of the company. This gives confidence and inspiration among the investors and creates an opportunity for the sector to grow even faster.

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